CLAIMS

What is claimed is:

1. A method for identifying a HLA-A2 supermotif-restricted peptide, comprising:

contacting a peptide consisting of 8-11 amino acids, wherein the amino acid at position two from the N-terminus of the peptide is L, I, V, M, A, T, or Q and the C-terminal amino acid is L, I, V, M, A, or T, with three or more of the HLA molecules encoded by A*0201, A*0202, A*0203, A*0204, A*0205, A*0206, A*0207, A*6802, and A*6901 alleles;

measuring IC_{50} values; and

identifying a peptide that binds at least three HLA molecules with an IC_{50} value less than 500 nM as a HLA-A2 supermotif restricted peptide.

2. The method of claim 1, wherein the amino acid at position two of the peptide is V, A, T, or Q.

3. The method of claim 1, wherein the amino acid at position two of the peptide is L, I, M, or Q.

4. The method of claim 1, wherein the amino acid at position two of the peptide is I or Q.

5. The method of claim 57, wherein the C-terminal amino acid is L, I, V, M, A, or T.

6. The method of claim 1, wherein the C-terminal amino acid is T.

7. The method of claim 1, wherein the peptide is derived from an HIV antigen, HBV antigen, HCV antigen, HPV antigen, PSA antigen, Epstein-Barr virus antigen, KSHV antigen, Lassa virus antigen, MT antigen, p53 antigen, CEA antigen, TSA antigen, MAGE antigen, or Her2/neu antigen.

8. A method for identifying an immunogenic HLA-A2 supermotif-restricted peptide, comprising:

contacting a peptide consisting of 8-11 amino acids, wherein the amino acid at position two from the N-terminus of the peptide is L, I, V, M, A, T, or Q and the C-terminal amino acid is L, I, V, M, A, or T to form peptide/HLA-A2 complexes, with three or more of the HLA molecules encoded by A*0201, A*0202, A*0203, A*0204, A*0205, A*0206, A*0207, A*6802, and A*6901 alleles;

determining whether the peptide/HLA-A2 complexes induce a CTL response, and

identifying a peptide that induces a CTL response in complex with at least three of the HLAs as a HLA-A2 supermotif restricted peptide.

9. The method of claim 8, wherein the amino acid at position two of the peptide is V, A, T, or Q.

10. The method of claim 8, wherein the amino acid at position two of the peptide is L, I, M, or Q.

11. The method of claim 8, wherein the amino acid at position two of the peptide is I or Q.

12. The method of claim 8, wherein the C-terminal amino acid is L, I, V, M, A, or T.

13. The method of claim 8, wherein the C-terminal amino acid is T.

14. The method of claim 8, wherein the peptide is derived from an HIV antigen, HBV antigen, HCV antigen, HPV antigen, PSA antigen, Epstein-Barr virus antigen, KSHV antigen, Lassa virus antigen, MT antigen, p53 antigen, CEA antigen, TSA antigen, MAGE antigen, or Her2/neu antigen.

15. A method for making a HLA-A2 supermotif-restricted peptide, comprising:

providing an amino acid sequence of an antigen of interest;

identifying within the sequence a putative T-cell epitope, wherein the putative epitope consists of 8-11 amino acids, wherein the amino acid at position two from the N-terminus of the epitope is L, I, V, M, A, T, or Q and the C-terminal amino acid is L, I, V, M, A, or T,

preparing one or more peptide fragments of the antigen of interest that comprise the epitope;

contacting the peptide with three or more of the HLA molecules encoded by A*0201, A*0202, A*0203, A*0204, A*0205, A*0206, A*0207, A*6802, and A*6901 alleles;

measuring IC_{50} values; and

selecting a peptide that binds at least three HLA molecules with an IC_{50} value less than 500 nM as a HLA-A2 supermotif-restricted peptide.

16. The method of claim 15, wherein the amino acid at position two of the peptide is V, A, T, or Q.

17. The method of claim 15, wherein the amino acid at position two of the peptide is L, I, M, or Q.

18. The method of claim 15, wherein the amino acid at position two of the peptide is I or Q.

19. The method of claim 15, wherein the C-terminal amino acid is L, I, V, M, A, or T.

20. The method of claim 15, wherein the C-terminal amino acid is T.

21. The method of claim 15, wherein the antigen is HIV, HBV, HCV, HPV, PSA, Epstein-Barr virus, KSHV, Lassa virus, MT, p53, CEA, TSA, MAGE, or Her2/neu.

22. A method for making an immunogenic HLA-A2 supermotif-restricted peptide, comprising:

providing an amino acid sequence of an antigen of interest;

identifying within the sequence a putative T-cell epitope, wherein the putative epitope consists of 8-11 amino acids, wherein the amino acid at position two from the N-terminus of the epitope is L, I, V, M, A, T, or Q and the C-terminal amino acid is L, I, V, M, A, or T,

preparing one or more peptide fragments of the antigen of interest that comprise the epitope;

determining whether the peptide/HLA-A2 complexes induce a CTL response, and

selecting a peptide that induces a CTL response in complex with at least three of the HLAs as a HLA-A2 supermotif restricted peptide.

23. The method of claim 22, wherein the amino acid at position two of the peptide is V, A, T, or Q.

24. The method of claim 22, wherein the amino acid at position two of the peptide is L, I, M, or Q.

25. The method of claim 22, wherein the amino acid at position two of the peptide is I or Q.

26. The method of claim 22, wherein the C-terminal amino acid is L, I, V, M, A, or T.

27. The method of claim 22, wherein the C-terminal amino acid is T.

28. The method of claim 22, wherein the antigen is HIV, HBV, HCV, HPV, PSA, Epstein-Barr virus, KSHV, Lassa virus, MT, p53, CEA, TSA, MAGE, or Her2/neu.